

DECLARATION

KEIICHI KISHI, of 991-5, Minaminakamaru, Minuma-ku,
Saitama-shi, Saitama, Japan, certify that I know well
both the English and Japanese languages and that the
attached English language translation is a true and
correct translation of Japanese Patent Application No.
2002-117205 filed on April 19, 2002 to the best of my
knowledge and belief.

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Keiichi Kishi

KEIICHI KISHI

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Applicant(s): Denki Kagaku Kogyo Kabushiki Kaisha

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【Inventor(s)】

【Name】 Hiroyuki Yashima

【Address or Residence】 Denki Kagaku Kogyo Kabushiki
Kaisha
Oumi Kojo
2209, Oaza-oumi, Oumi-machi,
Nishi-kubiki-gun, Niigata

【Inventor(s)】

【Name】 Kenji Mochizuki

【Address or Residence】 Denki Kagaku Kogyo Kabushiki
Kaisha
Oumi Kojo
2209, Oaza-oumi, Oumi-machi,
Nishi-kubiki-gun, Niigata

【Patent Applicant(s)】

【Identification No.】 000003296

【Name or Company Name】 Denki Kagaku Kogyo Kabushiki
Kaisha

【Representative】 Toshio Hiruma

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【TYPE OF DOCUMENT】 SPECIFICATION

【TITLE OF THE INVENTION】

LATEX COMPOSITION AND LAMINATE

【SCOPE OF THE CLAIM(S)】

5 【Claim 1】

A latex composition characterized by comprising from 1 to 70 parts by mass, per 100 parts by mass of a polychloroprene latex, of an EVA resin.

 【Claim 2】

10 The latex composition according to Claim 1, wherein a mass ratio of ethylene is at least 40% in the EVA resin.

 【Claim 3】

 The latex composition according to Claim 1 or 2,
15 wherein the polychloroprene latex is one prepared by polymerizing 100 parts by mass of chloroprene and from 0.1 to 10 parts by mass of an ethylenically unsaturated carboxylic acid in the presence of from 0.5 to 10 parts by mass of polyvinyl alcohol and then, adding a pH
20 adjusting agent to adjust the pH of the latex to from 6 to 10.

 【Claim 4】

 The latex composition according to Claim 3, wherein an amount of the ethylenically unsaturated carboxylic
25 acid is from 0.5 to 4 parts by mass.

[Claim 5]

The latex composition according to any one of Claim 3 or 4, wherein saponification degree of the polyvinyl alcohol is from 60 to 98 mol%.

5 [Claim 6]

The latex composition according to any one of Claim 1 to 5, wherein gel content of the polychloroprene latex is from 5 to 70 mass%.

[Claim 7]

10 The latex composition according to any one of Claims 1 to 6, which contains an adhesive resin.

[Claim 8]

The latex composition according to any one of Claims 1 to 7, which contains a metal oxide.

15 [Claim 9]

The latex composition according to Claim 8, wherein the metal oxide is zinc oxide.

[Claim 10]

20 A method for bonding a porous organic material and a cloth, which comprises using the latex composition as defined in any one of Claims 1 to 9 as an adhesive.

[Claim 11]

25 A laminate characterized in that it is formed by bonding a porous organic material and a cloth by means of the latex composition as defined in any one of Claims 1 to 9.

【Claim 12】

The laminate according to Claim 11, wherein the porous organic material is a foamed EVA.

【DETAILED DESCRIPTION OF THE INVENTION】

5 【Technical Field to which the Invention Belongs】

The present invention relates to a latex composition useful as an adhesive or a primer which is used for bonding components of furniture, bedclothes, automobile accessories, shoe parts such as shoe soles or a shoe
10 sockings of athletic shoes, walking shoes, sandals, etc., parts required to have cushioning property or parts required to have shock absorption, of wet suits, clothings, health appliances, etc.; and a laminate produced by employing it.

15 【Prior Art】

Heretofore, a polychloroprene (hereinafter referred to as CR) solvent type adhesive was used for producing a laminate for a shoe sole, a shoe socking or the like of an athletic shoe, a walking shoe or the like.

20 However, the CR solvent type adhesive contains an organic solvent such as toluene, ethyl acetate or methyl ethyl ketone. The organic solvent evaporates at work area during coating operation of the adhesive, and such evaporation is undesirable for safety and health of
25 workers and for the environment. That is why reduction of organic solvent has been desired.

[Problems that the Invention is to Solve]

It is an object of the present invention to provide a latex composition free from problems from the viewpoint of safety and health and from the viewpoint of environment, unlike the conventional CR solvent type adhesive, and having high adhesive strength and adhesive water resistance at a level equal to or higher than the conventional CR solvent type adhesive and a laminate produced by bonding a porous organic material and a cloth by means of it.

[Means of Solving the Problems]

As a latex composition which can be substituted for the CR solvent type adhesive, a polychloroprene latex as described in, for example, JP-A-07-33912, but the adhesive strength and adhesive water resistance were inadequate.

The present inventors have conducted studies to attain the above object, and as a result, have found a latex composition comprising a polychloroprene latex and an EVA resin as main components.

Namely, the present invention is a latex composition characterized by comprising from 1 to 70 parts by mass, per 100 parts by mass of the polychloroprene latex, of an EVA resin, as main components; and a laminate formed by bonding a porous organic material and a cloth by means of it, which is excellent in adhesive strength and adhesive water

resistance.

Now, the present invention will be described in further detail.

The EVA resin of the present invention is a
5 copolymer resin of ethylene/vinyl acetate and is preferably used in an emulsion state. A method to obtain the EVA resin emulsion is not particularly restricted, and a known method may be used. For example, after the EVA polymer is dissolved in an organic solvent, hot water
10 and an emulsifying agent are added and dispersed, whereupon the solvent is removed under reduced pressure to obtain a latex. The organic solvent is not particularly restricted. For example, one which is able to dissolve the EVA polymer such as toluene, xylene, n-
15 hexane or cyclohexane may be mentioned.

Further, one containing at most 35 mass% of ethylene may be produced by convention emulsion polymerization.

As the emulsifying agent, as an anionic type, there are a carboxylic acid type and a sulfuric ester type.
20 For example, an alkali metal salt of resin acid, an alkyl sulfonate, or a condensate of sodium naphthalenesulfonate with formaldehyde is mentioned. As a nonionic type, there are, for example, a water-soluble polymer type, an ether type, an ester type, an alkyl phenol type and a
25 sorbitan ester type. For example, a polyvinyl alcohol, a polyoxyethylene monostearate, or a sorbitan monooleate may be mentioned.

The mass ratio of ethylene in the EVA resin is preferably at least 40%, more preferably at least 60%, in order to improve the adhesive water resistance of the laminate.

5 The content of the EVA resin in the composition of the present invention is required to be from 1 to 70 parts by mass per 100 parts by mass of polychloroprene latex. More preferably, it is from 2 to 30 parts by mass. If it is less than 1 part by mass, the adhesive strength
10 and water resistance of the laminate will be inadequate. If it exceeds 70 parts by mass, the adhesive strength will be low.

 The emulsifying agent which is used for the polychloroprene latex of the present invention is not
15 particularly restricted. Various types of emulsifying agents or dispersing agents, of anionic type, nonionic type or cationic type may be used.

 As the anionic type, there is, for example, a carboxylic acid type or a sulfuric ester type. As a
20 specific example, an alkali metal salt of rein acid, a C_8-20 alkyl sulfonate, an alkylaryl sulfate or a condensate of sodium naphthalenesulfonate with formaldehyde, may be mentioned.

 As the nonionic type, there is, for example, a
25 water-soluble polymer type, an ether type, an ester type, a sorbitan ester type, a sorbitan ester ether type or an alkyl phenol type. As a specific example, polyvinyl

alcohol, polyoxyethylene monostearate, polyoxyethylene dodecyl ether, polyoxyethylenebenzyl styryl ether or sorbitan oleate may be mentioned.

As the cationic type, there is, for example, an
5 aliphatic amine salt, an aliphatic quaternary amine salt, an aromatic quaternary amine salt or a heterocyclic quaternary amine salt. As a specific example, octadecyltrimethyl ammonium chloride, hexadecyltrimethyl ammonium chloride, dodecyltrimethyl ammonium chloride or
10 dilauryldimethyl ammonium chloride may be mentioned.

The polychloroprene latex in the present invention is preferably one obtained by polymerization using a polyvinyl alcohol as the emulsifying agent. If emulsion polymerization is carried out by means of the polyvinyl
15 alcohol, stronger adhesion of the laminate may be possible.

The polyvinyl alcohol of the present invention is not particularly restricted, but is preferably one, of which the saponification degree is within a range of from
20 60 to 98 mol%. More preferably, the saponification degree is from 75 to 90 mol%.

Further, the degree of polymerization of the polyvinyl alcohol is preferably within a range of from 200 to 3000. More preferably, the degree of
25 polymerization is from 200 to 700.

If the polyvinyl alcohol is within this range, polymerization operation can be carried out stably, the

obtained latex has excellent stability, and a stable latex can be obtained at a high concentration.

As the amount of addition of the polyvinyl alcohol in the present invention, it is preferably from 0.5 to 10 parts by mass per 100 parts by mass of chloroprene. It is more preferably from 2 to 5 parts by mass and most preferably from 3 to 4 parts by mass. If the amount of addition of the polyvinyl alcohol is less than 0.5 part by mass, the emulsifying power tends to be inadequate, and aggregates tend to form during polymerization. If it exceeds 10 parts by mass, the production may sometimes become difficult, since increase of the viscosity occurs during polymerization, whereby stirring will be hindered and epidemic heat will be developed.

In the present invention, as a specific example of the ethylenically unsaturated carboxylic acid, acrylic acid, methacrylic acid, crotonic acid, fumaric acid, maleic acid, citraconic acid or glutaconic acid may be mentioned. These may be employed alone or in combination of two or more of them. Further, in the present invention, it is preferred to employ acrylic acid or methacrylic acid, and it is particularly preferred to employ methacrylic acid.

The amount of use of the ethylenically unsaturated carboxylic acid is preferably from 0.1 to 10 parts by mass per 100 parts by mass of chloroprene. It is more preferably from 0.5 to 4 parts by mass and most

preferably from 0.8 to less than 2 parts by mass. If the amount of addition of the ethylenically unsaturated carboxylic acid is less than 0.1 part by mass, the production will be difficult due to poor stability of the latex and the ordinary state adhesive strength will also be low. If the amount of addition of the ethylenically unsaturated carboxylic acid exceeds 10 parts by mass, the adhesive water resistance will be remarkably low.

Further, the chloroprene polymer to be used in the present invention may contain, in addition to chloroprene and ethylenically unsaturated carboxylic acid, a small amount of other monomers which are copolymerizable therewith. These are also included in the present invention.

As the monomer copolymerizable with chloroprene in the present invention, for example, 2,3-dichloro-1,3-butadiene, 1-chloro-1,3-butadiene, butadiene, isoprene, styrene, acrylonitrile, an ester of acrylic acid or an ester of methacrylic acid may be mentioned. If necessary, two or more of them may be employed in combination.

Further, in the polychloroprene latex of the present invention, the toluene-insoluble gel content is preferably within a range of from 5 to 70 mass%, more preferably within a range of from 15 to 55 mass%. If the gel content is less than 5 mass%, the ordinary state adhesive strength will be low. If the gel content exceeds 70 mass%, the initial adhesive strength and

adhesive water resistance will be low.

It is possible to control the gel content of the polychloroprene latex by adjusting (1) the use and the amount of use of a chain transfer agent, (2) the
5 polymerization temperature and (3) the final conversion of the monomer.

First, the chain transfer agent is not particularly limited as long as it is one commonly employed for the production of a polychloroprene. For example, a known
10 chain transfer agent, such as a long chain alkyl mercaptan such as n-dodecyl mercaptan, n-octadecyl mercaptan or tert-dodecyl mercaptan, a dialkyl xanthogen disulfide such as diisopropyl xanthogen disulfide or diethyl xanthogen disulfide, or iodoform, may be used.

15 Next, the polymerization temperature is preferably within a range of from 0 to 55°C from the viewpoint of control of the polymerization. Further, the polymerization temperature is particularly preferably within a range of from 30 to 50°C to carry out the
20 polymerization reaction more smoothly and safely.

Further, the final conversion of the monomer is preferably at least 80 mass% and more preferably at least 90 mass%.

In the present invention, a solid content
25 concentration of the polychloroprene latex can be adjusted to a required concentration by concentration or dilution with water. However, it is preferably within a

range of from 40 to 65 mass%, more preferably from 43 to 58 mass%. The higher the solid content concentration, the faster the drying speed, and the better the initial adhesive strength of the latex. Further, the solid
5 content concentration may be adjusted by adjusting the ratio of the monomers at the time of polymerization, but it may be adjusted by concentration after the polymerization.

A pH adjusting agent in the present invention is
10 used for adjusting the pH of the chloroprene polymer latex just after polymerization. For example, one or more may optionally be selected for use from strong basic substances such as sodium hydroxide, potassium hydroxide, diethanolamine and triethanolamine and salts showing
15 basicity such as sodium carbonate, potassium carbonate, trisodium phosphate, disodium hydrogen phosphate, tripotassium phosphate, dipotassium hydrogen phosphate, tripotassium citrate, dipotassium hydrogen citrate, sodium acetate, potassium acetate and sodium tetraborate.

20 A method for adding the pH adjusting agent in the present invention is not particularly restricted. A powder of the pH adjusting agent may be directly added or added after dilution with water to an optional ratio. The adjusting range of pH is preferably from 6 to 10.

25 As a catalyst which is used for the polymerization of polychloroprene in the present invention, an inorganic peroxide such as potassium persulfate, or an organic

peroxide such as a ketone peroxide, a peroxyketanol, a hydroperoxide, a dialkyl peroxide or a diacyl peroxide may be mentioned. It is preferred to use potassium persulfate as the catalyst in order to carry out stable
5 polymerization. Further, potassium persulfate is preferably used in the form of an aqueous solution of from 0.1 to 5 mass%.

In order to improve the activity of the catalyst which is used for polymerization of the polychloroprene
10 latex in the present invention, it is possible to add e.g. sodium sulfite, potassium sulfite, ferrous sulfate, sodium anthraquinone β -sulfonate, formamidine sulfonic acid or L-ascorbic acid.

For the purpose of controlling or terminating the
15 polymerization reaction of the polychloroprene latex in the present invention, it is possible to use a polymerization inhibitor. As the polymerization inhibitor in the present invention, thiodiphenylamine, diethylhydroxylamine, hydroquinone, p-t-butyl catechol,
20 1,3,5-trihydroxybenzene or hydroquinone methyl ether may, for example, be mentioned.

For the purpose of preventing color change, etc., it is possible to add an oxidation inhibitor to the polychloroprene latex in the present invention. For
25 example, 2,6-di-t-butyl-4-methylphenol, 2,2-methylenebis(6-t-4-methylphenol), 4,4-buthylenebis(6-t-butyl-3-methylphenol), ethylenebis(oxyethylene)bis[3-(5-

t-butyl-4-hydroxy-m-tolyl)propionate], octadecyl-3-(3,5-di-t-butyl-4-hydroxyphenyl)propionate, or pentaerythritol-tetrakis[3-(3,5-di-t-butyl-4-hydroxyphenyl)propionate] may be mentioned.

5 For the purpose of improving the initial adhesive strength, it is possible to add an adhesive resin to the latex composition of the present invention. As the adhesive resin, a resin acid ester resin, a terpenephenol resin, a cumarone-indene resin, an aliphatic hydrocarbon
10 resin or an aromatic resin may, for example, be mentioned. Especially an emulsion of a terpenephenol resin or a resin acid ester resin is preferred in order to have the initial adhesive strength and adhesive water resistance of the adhesive composition developed.

15 The amount of the adhesive resin to be added is preferably from 20 to 150 parts by mass, more preferably from 30 to 100 parts by mass, per 100 parts by mass of the polychloroprene latex. If it is either less than 20 parts by mass or more than 150 parts by mass, no adhesive
20 strength will be imparted.

 It is possible to add a metal oxide to the latex composition of the present invention to improve the adhesive water resistance. As such a metal oxide, zinc oxide, titanium oxide, zirconium oxide, aluminum oxide,
25 boron oxide, tin oxide, magnesium oxide and vanadium oxide may, for example, be mentioned. Zinc oxide, titanium oxide, aluminum oxide and zirconium oxide are

preferred to improve the water resistance of the adhesive composition, and particularly preferred is zinc oxide.

The amount of the metal oxide to be added is preferably from 0.2 to 8.0 parts by mass, particularly preferably from 0.5 to 6.0 parts by mass. If it is less than 2.0 parts by mass, the effect for imparting water resistance will be low. Further, if it exceeds 8.0 parts by mass, the adhesive strength will be poor.

The latex composition of the present invention may optionally contain, as the case requires, a curing accelerator such as an isocyanate or ethylenetiourea, an inorganic compound such as calcium carbonate, silica, talc or clay, a plasticizer softening agent such as dibutyl phthalate or process oil, a thickener such as sodium polyacrylate, water soluble polyurethane or methyl cellulose, a surfactant such as a polyoxyalkylene alkyl ether, a 1:2 mol type aliphatic alkanol amide, a 1:1 mol type diethanol amide or polyoxyethylene stearate, a film-forming assistant such as propylene glycol n-butyl ether, dipropylene glycol n-butyl ether or tripropylene glycol n-butyl ether, an antiseptic such as 1,2 benzothiazoline, a dye, an age resister, an ultraviolet absorber such as 2(2'-hydroxy-3'-t-butyl-5'-methylphenyl)-5-chlorobenzotriazole.

The latex composition of the present invention is produced by mixing the polychloroprene latex, an EVA resin and other additives. The mixing apparatus is not

particularly restricted and a known apparatus such as a three-one motor, a homogenizer, a media mill and a colloid mill may be used.

A coating method of the latex composition of the present invention is not particularly restricted. However, the coating may be preferably carried out on a porous organic material side only. A method of coating a porous organic material with the latex composition is preferably automated machine coating, whereby uniform coating is possible, but it is not particularly restricted. Usually, a method such as brush coating, pallet coating, spray coating, roll coater coating or bar coater coating is possible.

The laminate of the present invention is obtained by coating a porous organic material with the latex composition, further laminating a cloth thereon, followed by pressing by means of a pressing machine. Such a bonding method and a laminating method are not particularly restricted. It is possible to introduce a preliminary drying step after coating a porous organic material with the latex composition and before laminating a cloth (hereinafter the bonding method which includes the preliminary drying will be referred to as dry bonding and the bonding method which includes no preliminary drying method will be referred to as wet bonding). Either bonding method of dry bonding or wet bonding may be employed for the laminate. When the initial strength

and ordinary state strength are important, the dry bonding method is preferred. Whereas, when the adhesive water resistance is important, the wet bonding method is preferred.

5 In a case where the preliminary drying is carried out, the temperature is preferably from 50 to 80°C, more preferably from 60 to 80°C. If it is higher than 80°C, the porous organic material may thermally be deformed before the pressing step. Further, it is possible to
10 carry out press bonding by means of a pressing machine after coating of adhesive and gluing together followed by drying at 100 to 140°C.

 The pressing method may be a hot press or a cold press. The hot press is carried out preferably from 100
15 to 170°C. In the case of the cold press, a step of preliminarily heating the porous organic material having a cloth put thereon to from 100 to 130°C is required before pressing. The pressure in the pressing step is not particularly restricted and may be set depending on
20 the particular purpose or application. However, it is preferably from 0.03 to 10 MPa, more preferably from 0.05 to 5 MPa, in order to secure adequate adhesive strength without destroying the porous organic material of the laminate. In the pressing step, shaping may be carried
25 out by, depending upon the particular purpose or application, a method of amplifying pressure while a sheet is in a softened state, for example, by a bleed

drawing method, a match mold method, a plug and ring method, a slip forming method (reducing mold method), a vacuum molding method or a compression molding method.

The cloth to be used in the present invention is a
5 woven fabric, a knitted fabric or a non-woven fabric, and its fiber material, tissue, yarn count, (T+W) density (T is warp and W is weft), thickness and the method for its production are not restricted and may be suitably
10 selected depending upon particular purpose or application and in consideration of the texture or color. As the woven fabric, for example, a spun woven fabric and a filament woven fabric may be mentioned. As the fiber material, cotton, silk, rayon, cupro, acetate, triacetate, nylon, polyester, acryl or promix may, for example, be
15 mentioned. The knitted fabric may also be called stockinet, knit or jersey cloth, and as its fiber material, cotton, silk, rayon, cupro, acetate, triacetate, nylon, polyester, acryl or promix may, for example be mentioned. As the non-woven fabric, wet type non-woven
20 fabric, chemical bond non-woven fabric, thermal bond non-woven fabric, air-laid non-woven fabric, spun lace non-woven fabric, spun bond non-woven fabric, melt blown non-woven fabric, needle punched non-woven fabric or stitch bond non-woven fabric may be mentioned. As its fiber
25 material, cotton, rayon, polyester, polypropylene, nylon, acryl, vinylon, glass fiber, pulp or carbon fiber may, for example be mentioned.

The porous organic material in the present invention is a foamed plastic or a foamed rubber (foam rubber). The foaming method and the material or thickness of the foam are not particularly restricted and may suitably be selected depending upon particular purpose or application and in consideration of the flexibility or strength of the material. As the foaming method, for example, melt foaming, solid phase foaming or cast foaming may be mentioned. As a specific example of melt foaming, chemical cross-linkage foaming, electron cross-linkage foaming, extrusion foaming, one step pressurizing foaming or two steps pressurizing foaming may be mentioned. As a specific example of the solid phase foaming, a beads method may, for example, be mentioned. As the cast foaming, molding foaming, block foaming (slab foaming), continuous laminate foaming, injection foaming or spray foaming may, for example, be mentioned. Further, as the material, a flexible foamed urethane, (hereinafter referred to as flexible foamed PUR), foamed polypropylene (hereinafter referred to as foamed PP), foamed polyethylene (hereinafter referred to as foamed PE), foamed ethylene vinyl acetate copolymer (hereinafter referred to as foamed EVA), foamed polyvinyl chloride (hereinafter referred to as foamed PVC) or foamed polychloroprene (hereinafter referred to as foamed CR) may, for example, be mentioned. Especially, flexible foamed PUR, foamed PP and foamed EVA, which are excellent

in processability by thermoforming are preferred. Particularly, foamed PP, of which the density before press bonding is from 10 to 80 Kg/m³, and foamed EVA, of which the density before press bonding is from 70 to 120 Kg/m³, are more preferred. Within this range of density, adhesion can be made more strong. Among these, foamed EVA is particularly preferred since it is easy to mold as well as it is possible to present strong adhesion. The density mentioned here is mass per unit volume of a substance at 23°C. It is obtained by measuring the size of a rectangular parallel piped material with a micrometer caliper to obtain its volume and measuring mass with a weighing machine. The thickness of the porous organic material is not particularly restricted and may be selected depending upon the particular purpose or application. For example, in an application to shoe stockings for athletic shoes, it is preferably at most 10 mm. Further, these porous organic materials may be ones which are obtained by laminating another sheet on these sheets as long as the bond surface is the above mentioned porous organic material.

[Examples]

Now, the present invention will be described with reference to Examples, but the present invention is by no means restricted by these Examples. Further, in the following Examples, "parts" and "%" are based on mass unless otherwise specified.

EXPERIMENT 1

Production of polychloroprene latex

Using a reactor having an internal capacity of 30
litters, under nitrogen stream, 94 parts by mass of water
5 and 3.5 parts by mass of polyvinyl alcohol (DENKA POVAL
B-05, saponification degree: 88 mol%, polymerization
degree: 550) were put, heated (60°C) and dissolved.
After cooling this aqueous solution to near room
temperature, 99 parts by mass of a chloroprene monomer,
10 1.0 part by mass of methacrylic acid and 0.3 part by mass
of octyl mercaptan were added thereto. While maintaining
it at 45°C, the solution was polymerized by using sodium
sulfite and potassium persulfate as initiators to obtain
a polychloroprene latex. The final rate of
15 polymerization was 99.5%.

Then, to this polychloroprene latex, a 10% sodium
carbonate aqueous solution was added to adjust the pH to
8.0, and then, 3 parts of a 20% aqueous solution of a
fatty acid alkanol amide (manufactured by Diamond
20 Shamrock Chemical) and 0.5 part by mass of an anti-
oxidant (SELOSOLH633, manufactured by CHUKYO YUSHI. CO.,
LTD) were added to obtain polychloroprene latex (A)
having its solid content adjusted to 47%.

Then, the following measurements were carried out
25 with respect to this polychloroprene latex (A).

Measurement of gel content

A sample of the polychloroprene latex was freeze-

dried and accurately weighed. The weight will be referred to as A. After dissolving it in toluene (adjusted to 0.6%), using a centrifuge and further using a wire mesh of 200 mesh, a gel was separated. The gel content was air-dried, in an atmosphere of 110°C for one hour and accurately weighed. The weight will be referred to as B.

The gel content was calculated by the following formula.

10 Gel content = $B/A \times 100$ (%)

The gel content of the polychloroprene latex (A) was 38%.

Production of latex composition

100 Parts by mass of the polychloroprene latex (A),
15 70 parts by mass of a terpene phenol resin (TAMANOL E-100, manufactured by ARAKAWA CHEMICAL INDUSTRIES, LTD.), 10 parts by mass of an EVA resin (EV-2, manufactured by CHUKYO YUSHI. CO., LTD., ethylene/vinyl acetate mass ratio: 72/28) and 1 part by mass of zinc oxide (AZ-SW, 20 manufactured by OSAKI INDUSTRY CO., LTD.) were stirred and mixed by a three-one motor to obtain a latex composition A.

EXAMPLE 1

Then, the latex composition A was coated on a
25 foamed EVA sheet (2A-1064, manufactured by MITSUFUKU INDUSTRY CO., LTD., thickness: 5 mm) by a brush. The amount of the latex composition A coated was 60 g (in wet

state)/m². A polyester woven fabric was overlaid on the foamed EVA sheet coated with the latex composition A and press bonded under a pressure of 1 MPa by a pressing machine heated to 120°C to obtain a laminate A. This
5 step of from coating to bonding will be referred to as the adhesive method (A).

The laminate was evaluated by the following methods.

Initial adhesive strength

After 10 minutes from press bonding, the peeling
10 strength at 180° was measured at a speed of 200 mm/min by a tensile tester.

Normal adhesive strength

After 5 days from press bonding, the peeling
strength at 180° was measured at a speed of 200 mm/min by
15 a tensile tester.

Adhesive water resistance

After 1 day from press bonding, the laminate was immersed in pure water at 23°C for 2 days. Then, the peeling strength at 180° was measured at a speed of 200
20 mm/min by a tensile tester.

EXAMPLE 2

100 Parts by mass of the polychloroprene latex (A) obtained in Experiment 1, 70 parts by mass of a resin acid ester resin (SK-90D, manufactured by HARIMA
25 CHEMICALS, INC.), 6 parts by mass of an EVA resin (EV-2, manufactured by CHUKYO YUSHI. CO., LTD, ethylene/vinyl acetate mass ratio: 72/28) and 1 part by mass of zinc

oxide (AZ-SW, manufactured by OSAKI INDUSTRY CO., LTD.) were stirred by a three-one motor to produce a latex composition B. The latex composition B was applied on a foamed EVA sheet (2A-1064, manufactured by MITSUFUKU
5 INDUSTRY CO., LTD., thickness: 5 mm) by a brush and bonded by the adhesive method (A) to obtain a laminate B.

EXAMPLE 3

The latex composition A obtained in Experiment 1 was applied on a foamed EVA sheet (2A-1064, manufactured
10 by MITSUFUKU INDUSTRY CO., LTD., thickness: 5 mm) by a brush. The amount of the latex composition A applied was 60 g in wet state/m². The coated EVA sheet was dried at 70°C for 1 minute to form an adhesive layer, and a polyester woven fabric was overlaid thereon and press-
15 bonded under a pressure of 1 MPa by a pressing machine at 120°C to obtain a laminate C. This step of from coating to bonding will be referred to as the adhesive method (B).

EXPERIMENT 2

The polymerization was carried out in the same
20 manner as in Experiment 1 except that 97 parts by mass of chloroprene monomer and 3.0 parts by mass of methacrylic acid were employed. Then, pH was adjusted to 7.0 by adding diethanolamine. Then, 3 parts of a 20% aqueous solution of a fatty acid alkanol amide (manufactured by
25 Diamond Shamrock Chemical) were added, and moisture was removed under reduced pressure by concentration to obtain polychloroprene latex B having its solid content adjusted

to 55%. Its gel content was 39%.

EXAMPLE 4

100 Parts by mass of the polychloroprene latex (B),
70 parts by mass of a terpene phenol resin (TAMANOL E-100,
5 manufactured by ARAKAWA CHEMICAL INDUSTRIES, LTD.), 10
parts by mass of an EVA resin (EV-2, manufactured by
CHUKYO YUSHI. CO., LTD, ethylene/vinyl acetate mass
ratio: 72/28) and 1 part by mass of zinc oxide (AZ-SW,
manufactured by OSAKI INDUSTRY CO., LTD.) were stirred
10 and mixed by a three-one motor to obtain a latex
composition C.

The latex composition C was applied on a foamed EVA
sheet (2A-1064, manufactured by MITSUFUKU INDUSTRY CO.,
LTD., thickness: 5 mm) by a brush and bonded by the
15 adhesive method (A) to obtain a laminate D.

EXAMPLE 5

100 Parts by mass of the polychloroprene latex (A)
obtained in Experiment 1, 70 parts by mass of a terpene
phenol resin (TAMANOL E-100, manufactured by ARAKAWA
20 CHEMICAL INDUSTRIES, LTD.), 10 parts by mass of an EVA
resin (EVA-59, manufactured by Denki Kagaku Kogyo
Kabushiki Kaisha, ethylene/vinyl acetate mass ratio:
27/73) and 1 part by mass of zinc oxide (AZ-SW,
manufactured by OSAKI INDUSTRY CO., LTD.) were stirred by
25 a three-one motor to obtain a latex composition D.

The latex composition D was applied on a foamed EVA
sheet (2A-1064, manufactured by MITSUFUKU INDUSTRY CO.,

LTD., thickness: 5 mm) by a brush and bonded by the adhesive method (A) to obtain a laminate E.

COMPARATIVE EXAMPLE 1

100 Parts by mass of the polychloroprene latex (A)
5 obtained in Experiment 1, 70 parts by mass of a terpene phenol resin (TAMANOL E-100, manufactured by ARAKAWA CHEMICAL INDUSTRIES, LTD.) and 1 part by mass of zinc oxide (AZ-SW, manufactured by OSAKI INDUSTRY CO., LTD.) were stirred and mixed by a three-one motor to obtain a
10 latex composition E.

The latex composition E was applied on a foamed EVA sheet (2A-1064, manufactured by MITSUFUKU INDUSTRY CO., LTD., thickness: 5 mm) by a brush and bonded by the adhesive method (A) to obtain a laminate F.

15 COMPARATIVE EXAMPLE 2

100 Parts by mass of the polychloroprene latex (A)
obtained in Experiment 2, 70 parts by mass of a resin ester resin (SK-90D, manufactured by HARIMA CHEMICALS, INC.) and 1 part by mass of zinc oxide (AZ-SW,
20 manufactured by OSAKI INDUSTRY CO., LTD.) were stirred and mixed by a three-one motor to produce a latex composition F. The latex composition F was applied on a foamed EVA sheet (2A-1064, manufactured by MITSUFUKU INDUSTRY CO., LTD., thickness: 5 mm) by a brush and
25 bonded by the adhesive method (A) to obtain a laminate G.

COMPARATIVE EXAMPLE 3

The latex composition E obtained in Comparative

Example 1 was applied on a foamed EVA sheet (2A-1064, manufactured by MITSUFUKU INDUSTRY CO., LTD., thickness: 5 mm) by a brush and bonded by the adhesive method (B) to obtain a laminate H.

5 COMPARATIVE EXAMPLE 4

100 Parts by mass of the polychloroprene latex (B) obtained in Experiment 4, 70 parts by mass of a terpene phenol resin (TAMANOL E-100, manufactured by ARAKAWA CHEMICAL INDUSTRIES, LTD.) and 1 part by mass of zinc
10 oxide (AZ-SW, manufactured by OSAKI INDUSTRY CO., LTD.) were stirred and mixed by a three-one motor to produce a latex composition G.

The latex composition G was applied on a foamed EVA sheet (2A-1064, manufactured by MITSUFUKU INDUSTRY CO.,
15 LTD., thickness: 5 mm) by a brush and bonded by the adhesive method (A) to obtain a laminate I.

Further, in some Examples, the results could not be identified with numerical values because materials were broken at a time of measurement due to high adhesive
20 strength.

[Table 1]

Unit for the amounts: parts by mass

	EXAMPLE 1	EXAMPLE 2	EXAMPLE 3	EXAMPLE 4	EXAMPLE 5
Name of latex composition	A	B	A	C	D
Polychloroprene latex (A)	100	100	100	0	100
Polychloroprene latex (B)	0	0	0	100	0
TAMANOL E-100	70	0	70	70	70
SK-90D	0	70	0	0	0
EV-2	10	6	10	10	0
EV-59	0	0	0	0	10
AZ-SW	1	1	1	1	1
Adhesive method	Adhesive method A Laminate A	Adhesive method A Laminate B	Adhesive method B Laminate C	Adhesive method A Laminate D	Adhesive method A Laminate E
Name of laminate					
Adhesive strength (N/mm)					
Initial adhesive strength	Material broken	Material broken	Material broken	Material broken	0.9
Normal adhesive strength	Material broken	Material broken	Material broken	Material broken	0.9
Adhesive water resistance	Material broken	Material broken	0.8	0.9	0.7

[Table 2]

Unit for the amounts: parts by mass

	COMPARATIVE EXAMPLE 1	COMPARATIVE EXAMPLE 2	COMPARATIVE EXAMPLE 3	COMPARATIVE EXAMPLE 4
Name of latex composition	E	F	E	G
Polychloroprene latex (A)	100	100	100	0
Polychloroprene latex (B)	0	0	0	100
TAMANOL E-100	70	0	70	70
SK-90D	0	70	0	0
EV-2	0	0	0	0
EV-59	0	0	0	0
AZ-SW	1	1	1	1
Adhesive method Name of laminate	Adhesive method A Laminate F	Adhesive method A Laminate G	Adhesive method B Laminate H	Adhesive method A Laminate I
Adhesive strength (N/mm)				
Initial adhesive strength	0.7	0.8	Material broken	0.6
Normal adhesive strength	0.8	0.9	Material broken	0.7
Adhesive water resistance	0.3	0.3	0.2	0.2

[Effects of the Invention]

Tables 1 and 2 clearly show that the latex composition of the present invention is excellent in the initial adhesive strength, normal adhesive strength and
5 adhesive water resistance, and thus are useful to bond materials required to have shock absorption such as furniture, bedclothes, automobile accessories, parts for shoes and wet suits.

[TYPE OF DOCUMENT]

ABSTRACT

[SUMMARY]

[OBJECT]

5 Providing a latex composition which is excellent in
adhesive strength and water resistance and a laminate
which is formed by bonding a porous organic material and
a cloth by means of it.

[MEANS OF SOLVING PROBLEMS]

10 A latex composition comprising 100 parts by mass of
a polychloroprene latex and from 1 to 70 parts by mass of
an EVA resin as main components; and a laminate which is
formed by bonding a porous organic material and a cloth
by means of it.

15 The EVA resin of the present invention is a
copolymer resin of ethylene/vinyl acetate, and it is
preferably used in an emulsion state.

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